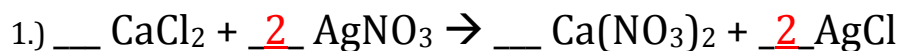


Units 8 & 9 Review



(A) Type of equation? **Double replacement**

(B) If 50.0 grams of calcium chloride are reacted with excess silver nitrate, how many grams of silver chloride can be produced? **129 g of AgCl (work shown below)**

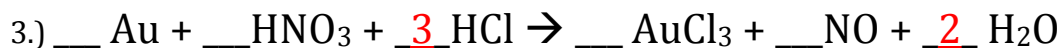
(C) What is the percent yield if a student makes 118 grams of silver chloride in this experiment?
91.5% yield



(A) Type of reaction? **Decomposition**

(B) A lab group decomposed 15.0 grams of $\text{Fe}(\text{HCO}_3)_3$. What is the theoretical yield of iron (III) oxide? **5.01 g**

(C) If the lab group produced 4.63 grams of iron (III) oxide, what is their percent yield? **92.4%**



(A) How many grams of hydrochloric acid (HCl) are needed to completely react 1.25 moles of gold metal? **137 g**

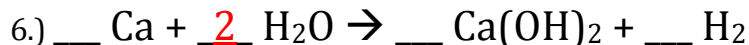


(A) How do we know that this reaction actually happens? **Fe is higher than Cu on Activity Series**

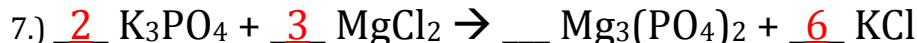
(B) When 3.7 moles of iron are reacted with excess copper (I) nitrate, how many moles of copper are produced? **7.4 moles**



(A) How many moles of CaSiO_3 would be produced by the complete reaction of 225.5 grams of calcium phosphate? **2.180 moles**

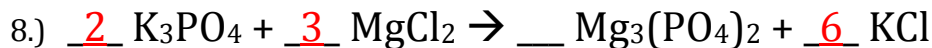


(A) How many molecules of water would be needed to react completely with 34.2 grams of calcium? **1.03×10^{24} molecules**

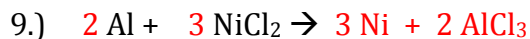


(A) What is the theoretical yield of potassium chloride if 21.7 grams of magnesium chloride are reacted with 25.4 grams of potassium phosphate? **26.8 g**

(B) How many grams of excess reactant remain after the reaction is complete? **4.6 g**



(A) How many grams of potassium chloride if 2.17×10^{24} molecules of magnesium chloride are reacted with excess potassium phosphate? **537 g**



Units 8 & 9 Review

- 12.) $\text{CsF} + \text{I}_2 \rightarrow$ no reaction
- 13.) $\text{Cl}_2 + 2 \text{NaBr} \rightarrow 2 \text{NaCl} + \text{Br}_2$
- 14.) $\text{Pb}(\text{ClO}_3)_2 + 2 \text{K} \rightarrow \text{Pb} + 2 \text{KClO}_3$
- 15.) $\text{Mn} + \text{LiOH} \rightarrow$ no reaction

=====

1. (B) If 50.0 grams of calcium chloride are reacted with excess silver nitrate, how many grams of silver chloride can be produced?

$$\frac{50.0 \text{ g CaCl}_2}{111.1 \text{ g}} \times \frac{1 \text{ mole}}{1 \text{ mole}} = 0.450 \text{ moles CaCl}_2$$

$$\frac{0.450 \text{ moles CaCl}_2}{1} = \frac{x \text{ moles AgCl}}{2} \quad x = 0.9 \text{ moles AgCl}$$

$$\frac{0.9 \text{ moles AgCl}}{1 \text{ mole}} \times 143.4 \text{ g} = 129 \text{ g AgCl}$$

(C) What is the percent yield if a student makes 118 grams of silver chloride in this experiment?

$$\frac{118 \text{ g}}{129 \text{ g}} \times 100 = 91.5\%$$

2. (B) A lab group decomposed 15.0 grams of $\text{Fe}(\text{HCO}_3)_3$. What is the theoretical yield of iron (III) oxide?

$$\frac{15.0 \text{ g Fe}(\text{HCO}_3)_3}{238.8 \text{ g}} \times \frac{1 \text{ mole}}{1 \text{ mole}} = 0.0628 \text{ moles Fe}(\text{HCO}_3)_3$$

$$\frac{0.0628 \text{ moles Fe}(\text{HCO}_3)_3}{2} = \frac{x \text{ moles Fe}_2\text{O}_3}{1} \quad x = 0.0314 \text{ moles Fe}_2\text{O}_3$$

$$\frac{0.0314 \text{ moles Fe}_2\text{O}_3}{1 \text{ mole}} \times 159.6 \text{ g} = 5.01 \text{ g}$$

(C) If the lab group produced 4.63 grams of iron (III) oxide, what is their percent yield?

$$\frac{4.63 \text{ g}}{5.01 \text{ g}} \times 100 = 92.4\%$$

3. (A) How many grams of hydrochloric acid (HCl) are needed to completely react 1.25 moles of gold metal?

$$\frac{1.25 \text{ moles Au}}{1} = \frac{x \text{ moles HCl}}{3} \quad 3.75 \text{ moles HCl}$$

$$\frac{3.75 \text{ moles HCl}}{1 \text{ mole}} \times 36.5 \text{ g} = 137 \text{ g}$$

4. (B) When 3.7 moles of iron are reacted with excess copper (I) nitrate, how many moles of copper are produced?

$$\frac{3.7 \text{ moles Fe}}{1} = \frac{x \text{ moles Cu}}{2} \quad x = 7.4 \text{ moles Cu}$$

5. (A) How many moles of CaSiO_3 would be produced by the complete reaction of 225.5 grams of calcium phosphate?

$$\frac{225.5 \text{ g}}{310.3 \text{ g}} \times \frac{1 \text{ mole}}{1 \text{ mole}} = 0.727 \text{ moles Ca}_3(\text{PO}_4)_2$$

$$\frac{0.727 \text{ moles Ca}_3(\text{PO}_4)_2}{1} = \frac{x \text{ moles CaSiO}_3}{3} \quad x = 2.181 \text{ moles CaSiO}_3$$

Units 8 & 9 Review

6. (A) How many molecules of water would be needed to react completely with 34.2 grams of calcium

$$\frac{34.2 \text{ g Ca} | 1 \text{ mole}}{| 40.1 \text{ g}} = 0.853 \text{ moles Ca}$$

$$\frac{0.853 \text{ moles Ca}}{1} = \frac{x \text{ moles H}_2\text{O}}{2} \quad x = 1.706 \text{ moles H}_2\text{O}$$

$$\frac{1.706 \text{ moles}}{| 1 \text{ mole}} | 6.022 \times 10^{23} \text{ mcs} = \mathbf{1.03 \times 10^{24} \text{ molecules H}_2\text{O}}$$

7. (A) What is the theoretical yield of potassium chloride if 21.7 grams of magnesium chloride are reacted with 25.4 grams of potassium phosphate?

$$\frac{21.7 \text{ g MgCl}_2 | 1 \text{ mole}}{| 95.3 \text{ g}} = 0.228 \text{ moles MgCl}_2$$

$$\frac{25.4 \text{ g K}_3\text{PO}_4 | 1 \text{ mole}}{| 212.3 \text{ g}} = 0.1196 \text{ moles K}_3\text{PO}_4$$

Determine LR.

$$\frac{0.228}{3} = 0.076$$

$$\frac{0.1196}{2} = 0.0598^{****}$$

$$\frac{0.1196 \text{ moles K}_3\text{PO}_4}{2} = \frac{x \text{ moles KCl}}{6}$$

$$x = 0.3588 \text{ moles KCl}$$

$$\frac{0.3588 \text{ moles KCl} | 74.6 \text{ g}}{| 1 \text{ mole}} = \mathbf{26.8 \text{ g KCl}}$$

(B) How many grams of excess reactant remain after the reaction is complete?

$$\frac{0.1196 \text{ moles K}_3\text{PO}_4}{2} = \frac{x \text{ moles MgCl}_2}{3}$$

$$x = 0.1794 \text{ moles MgCl}_2$$

$$\frac{0.1794 \text{ moles MgCl}_2 \text{ used} | 95.3 \text{ g}}{| 1 \text{ mole}} = 17.1 \text{ g used}$$

$$21.7 \text{ g} - 17.1 \text{ g} = \mathbf{4.6 \text{ g left over}}$$

8. (A) How many grams of potassium chloride if 2.17×10^{24} molecules of magnesium chloride are reacted with excess potassium phosphate? **537 g**

$$\frac{2.17 \times 10^{24} \text{ mcs MgCl}_2 | 1 \text{ mole}}{| 6.022 \times 10^{23} \text{ mcs}} = 3.60 \text{ moles MgCl}_2$$

$$\frac{3.60 \text{ moles MgCl}_2}{3} = \frac{x \text{ moles KCl}}{6}$$

$$x = 7.2 \text{ moles KCl}$$

$$\frac{7.2 \text{ moles KCl} | 74.6 \text{ g}}{| 1 \text{ mole}} = \mathbf{537 \text{ g KCl}}$$